

## YBC 11381:

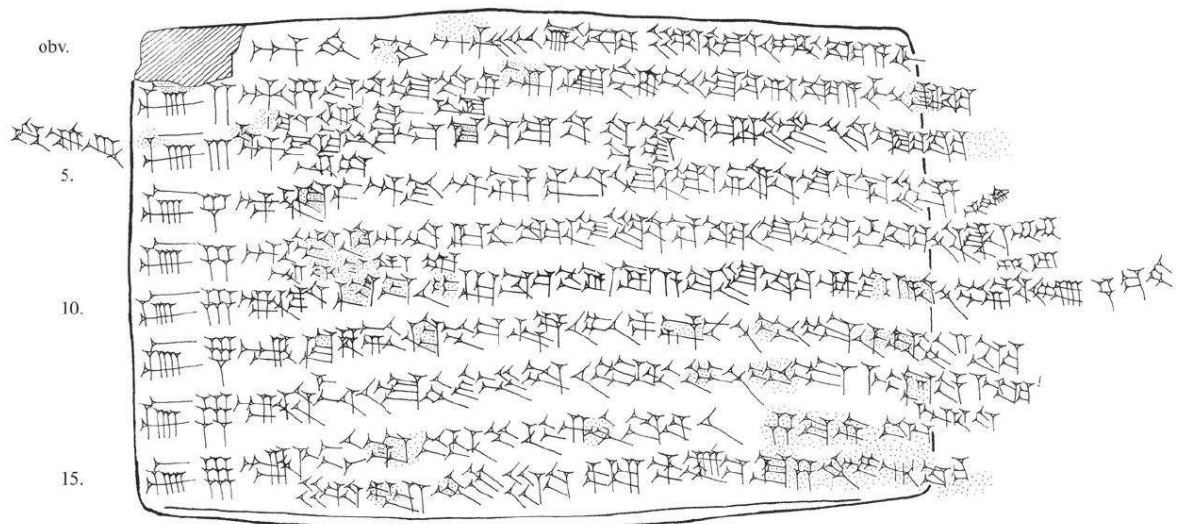
### *New evidence for Neo-Babylonian Enneatonism in Music Theory*

Richard Dumbrill

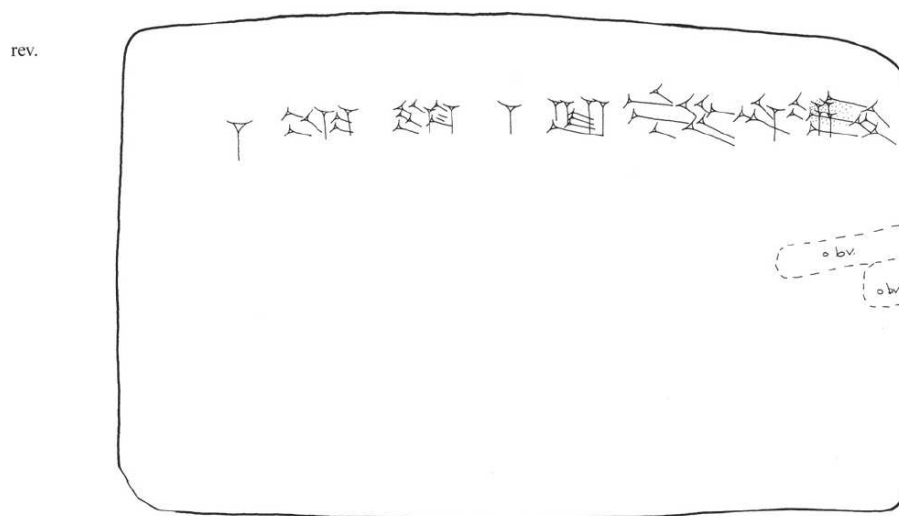
#### *Introduction*

The recently published Neo-Babylonian<sup>1</sup> text in the Yale Babylonian Collection YBC 11381 by Elizabeth E. Payne<sup>2</sup>, is certainly one of the most significant additions to the corpus of music theory for the past fifty years.<sup>3</sup> I will discuss archaeomusicology, exclusively, and therefore will be relying on Payne's transliteration and translation in this paper.

#### YBC 11381



Payne's Hand copy of YBC 11381, obv. (5.8 x 8.9 x 2.5 cm)



Payne's Hand copy of YBC 11381, rev. (5.8 x 8.9 x 2.5 cm)

## Payne's transliteration

|       |   |
|-------|---|
| Obv.  | [sa] 1 <sup>d</sup> an.šár ʾlugal dingir <sup>meš</sup> be-lut-ka li-dam-mi-iq ka-a-ši<br>sa 2 <sup>d</sup> 15 ba-na-at te- ʾné-šit <sup>ʾ</sup> tu-ub lib-bi u la-ba-ri ka-as-ši liš- ʾruk <sup>ʾ</sup> -ka<br>Sig da-ar!-gal kak-ku<br>sa 3 <sup>d</sup> dāra.gal <sup>giš</sup> tukul ez-zu-tú u <sub>4</sub> -mu na-al-bu-bu liš-tam-ḥir-ka [(x)]   |
| 5     | en du qa-at<br>sa 4 <sup>d</sup> en <sup>1</sup> ʾki <sup>ʾ</sup> .dù <sup>d</sup> gašan <sup>d</sup> lamma pa-ti-qat dam-qá-a-tú la-mas-si bu-un-(ni)<br>gi-ir<br>sa 5 <sup>d</sup> ʾdam.ki <sup>ʾ</sup> .an.na téš-lit-ka šu-le-e-ka u la-ban ap-pi-ka liš-tam-gir ana en.en<br>en- ʾda-šu <sup>ʾ</sup> -ru-um ri-ib  |
| 10    | sa 6 <sup>d</sup> en.da. ʾšurim.ma mi <sup>ʾ</sup> -lik-ka nak-lu a-ma-tu-ka aq- ʾra <sup>ʾ</sup> -a-tú liš-taq-rib<br>u <sub>4</sub> -mi-šam šá-am<br>sa 7 <sup>d</sup> en.du <sub>6</sub> .kù.ga ʾki <sup>ʾ</sup> -bi-is šul-mi u pa- ʾdan <sup>ʾ</sup> -nu liš-tak-kan ana ši- ʾkin <sup>ʾ</sup> gir <sup>ll</sup> -ka ME<br>sa 8 <sup>d</sup> en.u <sub>4</sub> .ti.la ḥi-šib tuḥ-du u ḥé.gál-lu <sub>4</sub> liš-tak-kan ana me- ʾrit <sup>ʾ</sup> érin <sup>me</sup> -ka <sup>1</sup><br>me-ri-tú |
| 15    | sa 9 <sup>d</sup> en.me.šār. ʾra <sup>ʾ</sup> il-lat rag- ʾgi <sup>ʾ</sup> -ka u ʾza-ma-ni-ka <sup>ʾ</sup><br>li-šab-bir li-sap-pi-iḥ <sup>giš</sup> ʾtukul za-ʾi-ri <sup>ʾ</sup> -ka   |
| rev.  | ana ka sar ana tu-ub-bi na- ʾas <sup>ʾ</sup> -ḥi  |
| le.e. | šal-šú uḥ-ri  |

## Payne's translation

|      |  |
|------|--|
| Obv. | STRING 1: May Aššur, the king of the gods, improve your dominion for you.<br>STRING 2: May Ištar, who created mankind, grant you well-being and longevity.<br>(gloss)  |
| 5    | STRING 3: May Daragal make you rival the fierce weapon (s and) the raging storm.<br>(gloss)<br>STRING 4: Enkidu, treat kindly the Lady, the protective spirit who created good things, the lamassu.<br>(gloss)<br>STRING 5: May Damkianna make your appeal, your prayers, and the stroke of your nose always pleasing to the lord of lords.<br>(gloss) |
| 10   | STRING 6: May Endašurimma present your artful advice and you precious words daily.<br>STRING 7: May Endukuga always let your footstep fall on a prosperous road and a smooth path. (gloss)<br>STRING 8: May Enudtila constantly establish abundance, plenty, and prosperity for the pastures of your people.<br>(gloss)                                |
| 15   | STRING 9: May Enmešarra crush the forces of those who wrong you and of your enemies. May he scatter the weapons of your adversaries.   |
| Rev. | Copied according to dictation; excerpted for (my) well-being. (left edge) The third (string) from the end.   |

## Commentary

The text lists nine strings. Each string number is followed by an incipit as has been generally agreed. The nine strings are obviously those known from A = *nabnitu XXXII* = UET VII 126<sup>4</sup> and suggested in B = U7/80 = UET VII, 74 (see below). Unlike their disposition in texts A and B where the nine strings (of the <sup>giš</sup>ZÀ.MÍ-instrument in U7/80) are listed, in A, or suggested, in B, palindromically as 1-2-3-4-5-4-3-2-1, (from Old Babylonian to Neo Assyrian, a period of about 1500 years) YBC 11381, henceforth text C, which is Neo Babylonian, has them listed sequentially as 1-2-3-4-5-6-7-8-9.

The argument in this paper is that the nine ‘sa’ in C are no longer used only for listing strings *per se* but would also be used for naming nine enneatonic scales generated from the system described in B.

All of my colleagues have argued, in the course of the last three decades, that I was wrong in asserting that the Babylonian system was enneatonic. They maintained that it was octaval<sup>5</sup>, diatonic<sup>6</sup> heptatonic,<sup>7</sup> following a long tradition of irrational but seldom disputed creed in Hellenocentric/Western

universality.<sup>8</sup> I have always maintained that heptatonism is synthetic<sup>9</sup> and probably found its roots in the Western mediaeval tradition/transmission of the Pythagorean myth.<sup>10</sup> There is no reasonable argument as to why the Babylonians should have used something essentially Occidental.<sup>11</sup> Such a system can only come from a construction the method of which must be clearly described in textual evidence without which it cannot be sustained.<sup>12</sup>

Moreover, and interestingly, C appears to be a forerunner for Plato's quantification of his nine Muses. In a notoriously difficult passage of *Republic*, (545c-546d)<sup>13</sup> the Muses speak about two harmonies, two Pythagorean heptachords<sup>14</sup> superimposed in such a way that their combination aggregates into an enneachord with pitch quantifications which might have come from the method in the text under scrutiny.

### The scale system

Text B has been reconstructed by Oliver Gurney in 1968<sup>15</sup> with contributions of David Wulstan, a Western musicologist specialist in Occidental music theory, and later, in 1994,<sup>16</sup> it was revised because of a pertinent new reading of a term by a Leiden Assyriologist. In Gurney's own words: '...Th.J.H.Krispijn has now perceived the correct reading of line 12, and in consequence of this the correct reading and restoration of the verb hitherto read *te-ni-m[a]* and the other verbs in the text, his discovery is hidden rather than published in the philological note to line 171 of a difficult Sumerian text in *Akkadica* 70 (Nov./Dec. 1990), 15. Line 12 is to be read *nu-su-ḥ[u-um]*, the D infin. Of the verb *nasāḥum*. This is the rubric belonging to the previous lines, the equivalent of a modern "heading", and implies that the same verb is to be restored throughout this first "chapter" in place of *te-ni-ma*, which was taken from line 19. *nasāḥum*, (Sumerian gíd-i), or *nussuḥum* (Sum. zi-zi), is the technical term for "to tighten" strings and its counterpart "to loosen" is *nê'um*, (Sum. tu-lu), which must therefore be found in line 19, read *te-ni-e!* The text must now be transliterated as follows:'

#### Gurney 1968

- [šum-ma<sup>gis</sup> ZÀ.MÍ pi-i-tum-ma]  
 1. [e-e]m-b[u-bu-um la za-ku]  
 2. ša-al-š[a-am qá-at-na-am te-ni-ma]  
 3. e-em-bu-bu-u[m iz/š-z/ša- . .]  
 4. šum-ma<sup>gis</sup> Z[À.MÍ e-em-bu-bu-um-ma]  
 5. ki-it-mu-um [la za-ku]  
 6. re-bi úḥ-ri-im [te-ni-ma]  
 7. ki-it-mu-um i[z/š-z/ša- . .]  
 8. šum-ma<sup>gis</sup> ZÀ.MÍ k[i-it-mu-um-ma]  
 9. i-šar-tum la za-[ka-at]  
 10. ša-mu-ša-am ù úḥ-ri-a-a[m te-ni-ma]  
 11. i-šar-tum iz/š-z/ša-[ . .]  
 12. NU SU  
 13. šum-ma<sup>gis</sup> ZÀ.MÍ i-šar-t[um-ma]  
 14. qá-ab-li-ta-am ta-al-pu-[ut]  
 15. ša-mu-ša-am ù úḥ-ri-a-am te-[ni-ma]  
 16. [gis] ZÀ.MÍ ki-it-mu-[um-ma]  
 17. [šum]-ma<sup>gis</sup> ZÀ.MÍ ki-it-m[u-um-ma]  
 18. [i-ša]r-ta-am la za-ku-ta-am t[a-al-pu-ut]  
 19. [re-bi]úḥ-ri-im te-n[i]-m[a]  
 20. [gis] ZÀ.MÍ e-em-bu-bu-um-ma]

#### Gurney 1994

- [šum-ma<sup>gis</sup> ZÀ.MÍ pi-i-tum-ma]  
 [e-e]m-b[u-bu-um la za-ku]  
 ša-al-š[a-am qá-at-na-am tu-na-sà-aḥ-ma]  
 e-em-bu-bu-u[m iz-za-ku]  
 šum-ma<sup>gis</sup> Z[À.MÍ e-em-bu-bu-um-ma]  
 ki-it-mu-um [la za-ku]  
 re-bi úḥ-ri-im [tu-na-sà-aḥ-ma]  
 ki-it-mu-um i[z-za-ku]  
 šum-ma<sup>gis</sup> ZÀ.MÍ k[i-it-mu-um-ma]  
 i-šar-tum la za-[ka-at]  
 ša-mu-ša-am ù úḥ-ri-a-a[m tu-na-sà-aḥ-ma]  
 i-šar-tum iz-za-[ku]  
 nu – su – ḥ[u – um]  
 šum-ma<sup>gis</sup> ZÀ.MÍ i-šar-t[um-ma]  
 qá-ab-li-ta-am ta-al-pu-[ut]  
 ša-mu-ša-am ù úḥ-ri-a-am te-[ni-e-ma]  
 [gis] ZÀ.MÍ ki-it-mu-[um]  
 [šum]-ma<sup>gis</sup> ZÀ.MÍ ki-it-m[u-um-ma]  
 [i-ša]r-ta-am la za-ku-ta-am t[a-al-pu-ut]  
 [re-bi]úḥ-ri-im te-ni-e ! [ma]  
 [gis] ZÀ.MÍ e-em-bu-bu-um]

Lines x to 11 constitute the first chapter ; lines 13 to y constitute the second chapter

As a consequence, it came to no surprise that the extrapolation for the missing parts of the text (beginning and end) led to a heptatonic reconstruction. But there is no logical reason why a ninth scale

would not have existed, placed at the beginning and the end of the text, now missing. Text B, unlike with Greek theory, does not rest on interval ratios, *i.e.* it does not say, for instance: take  $\frac{1}{2}$  of the string length, then take  $\frac{2}{3}$ , of it, etc. Differently, B is all about tension of strings (Akkadian *nussuhum*, Sumerian *zi-zi*) and their relaxation (Akkadian *nê'um*, Sumerian *gíd-i*). The amount of tension and relaxation is not given and therefore it can only be guessed that they used Just intervals (Akkadian *zakû* = clear). They called the dissonant 'palaeo'-tritone by (Akkadian *la zakû* = not clear)<sup>17</sup>.

Therefore the manner in which instructions<sup>18</sup> are given in B imply that they would have left room for local, regional, or, and national tone inflections in Old Babylonian systems allowing for specific intervals, to be tuned slightly wider, or slightly smaller than the Just paradigms<sup>19</sup>. These could only be expressed in terms of tension and relaxation and tuned by ear only, from a master's teachings through metaphors, and metonymy, (omnipresent in the terminology) and not with complex ratio theories. The method could have been applied to a variety of temperaments, and tunings. This was not possible with the Greek systems where all was implacably ruled by ratios of string lengths and essentially rested on theory. Aristoxenus, was an exception. He would have preferred speaking in terms of tension (ἐπίτασις) and relaxation (ἀνεσις),<sup>20</sup> also, but how much of Aristoxenus' works are really his and not mediaeval transpositions of Eastern theories, to Western ones. After all, al-Farabi, conveniently latinised as Alfarabius, who thought that Arabian music rested on Greek theory, had lost all knowledge of any Babylonian antecedence.

Since the system in B relies solely on tension and relaxation of strings, it follows that the magic ratio of  $\frac{2}{1}$ , the octave, is irrelevant. The octave<sup>21</sup> was unknown to the Old Babylonians for the reason that they did not need it for the construction of their scales. Furthermore they had no name for it, as far as we know. Although the 'Gurney/Wulstan theory', is interpreted as expressing octaval diatonic heptatonism, all seem to ignore that the first extrapolated scale of *išartum*, is not at the octave of the last *išartum* in each of the chapters. It is either higher, or lower, by an unqualified semitone and I cannot, therefore, understand the generally sustained octaval obsession upheld by most musicologists. Babylonian and later Greeks systems are fundamentally different. It would appear logical that the Babylonians, after having adopted an enneatonic generative scale, would have had a set of nine sub-systems. These scales would have stemmed from their fundamental or generative scale, as shown below, for the first chapter of B with the second chapter relaxing the tension in each scale as a reverse process of chapter one.

*Tension (chapter one)*

|   |                    |  |
|---|--------------------|--|
| 1 | <i>kitmum:</i>     | c-b <sup>b</sup> -a-g-f-e-d-c-b <sup>b</sup>   |
| 2 | <i>išartum:</i>    | c-b-a-g-f-e-d-c-b  |
| 3 | <i>qablītum:</i>   | c-b-a-g-f <sup>#</sup> -e-d-c-b  |
| 4 | <i>nīš tuḫrim:</i> | c <sup>#</sup> -b-a-g-f <sup>#</sup> -e-d-c <sup>#</sup> -b  |
| 5 | <i>nīd qablim:</i> | c <sup>#</sup> -b-a-g <sup>#</sup> -f <sup>#</sup> -e-d-c <sup>#</sup> -b  |
| 6 | <i>pītum:</i>      | c <sup>#</sup> -b-a-g <sup>#</sup> -f <sup>#</sup> -e-d <sup>#</sup> -c <sup>#</sup> -b  |
| 7 | <i>embūbum:</i>    | c <sup>#</sup> -b-a <sup>#</sup> -g <sup>#</sup> -f <sup>#</sup> -e-d <sup>#</sup> -c <sup>#</sup> -b  |
| 8 | <i>kitmum:</i>     | c <sup>#</sup> -b-a <sup>#</sup> -g <sup>#</sup> -f <sup>#</sup> -e <sup>#</sup> -d <sup>#</sup> -c <sup>#</sup> -b                            |
| 9 | <i>išartum:</i>    | c <sup>#</sup> -b <sup>#</sup> -a <sup>#</sup> -g <sup>#</sup> -f <sup>#</sup> -e <sup>#</sup> -d <sup>#</sup> -c <sup>#</sup> -b <sup>#</sup> |

*Relaxation (chapter 2)*

|   |                    |  |
|---|--------------------|--|
| 9 | <i>išartum:</i>    | c <sup>#</sup> -b <sup>#</sup> -a <sup>#</sup> -g <sup>#</sup> -f <sup>#</sup> -e <sup>#</sup> -d <sup>#</sup> -c <sup>#</sup> -b <sup>#</sup> |
| 8 | <i>kitmum:</i>     | c <sup>#</sup> -b-a <sup>#</sup> -g <sup>#</sup> -f <sup>#</sup> -e <sup>#</sup> -d <sup>#</sup> -c <sup>#</sup> -b                            |
| 7 | <i>embūbum:</i>    | c <sup>#</sup> -b-a <sup>#</sup> -g <sup>#</sup> -f <sup>#</sup> -e-d <sup>#</sup> -c <sup>#</sup> -b  |
| 6 | <i>pītum:</i>      | c <sup>#</sup> -b-a-g <sup>#</sup> -f <sup>#</sup> -e-d <sup>#</sup> -c <sup>#</sup> -b  |
| 5 | <i>nīd qablim:</i> | c <sup>#</sup> -b-a-g <sup>#</sup> -f <sup>#</sup> -e-d-c <sup>#</sup> -b  |
| 4 | <i>nīš tuḫrim:</i> | c <sup>#</sup> -b-a-g-f <sup>#</sup> -e-d-c <sup>#</sup> -b  |
| 3 | <i>qablītum:</i>   | c-b-a-g-f <sup>#</sup> -e-d-c-b  |
| 2 | <i>išartum:</i>    | c-b-a-g-f-e-d-c-b  |
| 1 | <i>kitmum:</i>     | c-b <sup>b</sup> -a-g-f-e-d-c-b <sup>b</sup>   |

It will be noted that these scales procede in fifths such as c-g-e-a-e-b-f<sup>#</sup>-c<sup>#</sup>-g<sup>#</sup>. Therefore, the eighth scale is not the repetition of the first one and the ninth is not the repetition of the second one.

Both differ by an unqualified semitone. Had the system been octaval, then the first and eighth scale would have been identical and so would have been the second and the ninth. It is possible to hypothesize that the nine incipits would have been sung to the following scales:

- sa 1 May Aššur, the king of the gods, improve your dominion for you.  
c-b<sup>b</sup>-a-g-f-e-d-c-b<sup>b</sup>
- sa 2 May Ištar, who created mankind, grant you well-being and longevity.  
c-b-a-g-f-e-d-c-b
- sa 3 May Daragal make you rival the fierce weapon (s and) the raging storm.  
c-b-a-g-f<sup>#</sup>-e-d-c-b
- sa 4 Enkidu, treat kindly the Lady, the protective spirit who created good things, the *lamassu*.  
c<sup>#</sup>-b-a-g-f<sup>#</sup>-e-d-c<sup>#</sup>-b
- sa 5 May Damkianna make your appeal, your prayers, and the stroke of your nose always pleasing to the lord of lords.  
c<sup>#</sup>-b-a-g<sup>#</sup>-f<sup>#</sup>-e-d-c<sup>#</sup>-b
- sa6 May Endašurimma present your artful advice and you precious words daily.  
c<sup>#</sup>-b-a-g<sup>#</sup>-f<sup>#</sup>-e-d<sup>#</sup>-c<sup>#</sup>-b
- sa7 May Endukuga always let your footstep fall on a prosperous road and a smooth path.  
c<sup>#</sup>-b-a<sup>#</sup>-g<sup>#</sup>-f<sup>#</sup>-e-d<sup>#</sup>-c<sup>#</sup>-b
- sa 8 May Enudtila constantly establish abundance, plenty, and prosperity for the pastures of your people.  
c<sup>#</sup>-b-a<sup>#</sup>-g<sup>#</sup>-f<sup>#</sup>-e<sup>#</sup>-d<sup>#</sup>-c<sup>#</sup>-b
- sa 9 May Enmešarra crush the forces of those who wrong you and of your enemies. May he scatter the weapons of your adversaries.  
c<sup>#</sup>-b<sup>#</sup>-a<sup>#</sup>-g<sup>#</sup>-f<sup>#</sup>-e<sup>#</sup>-d<sup>#</sup>-c<sup>#</sup>-b<sup>#</sup>

Payne has mentioned a parallel with another text in the British Museum: BM 65217 + 66616<sup>22</sup>. However, this text only lists five strings and is therefore irrelevant to this enneatonic proposition.

<sup>1</sup> As stated by Payne (see note 2 below) this tablet can be approximatively placed as Neo-Babylonian on the basis of its orthography. This opinion is also shared with Finkel.

<sup>2</sup> Payne, E.E., 'A new Addition to the Musical Corpus' in *Opening the Tablet Box, Near Eastern Studies in Honor of Benjamin R. Foster*. Sarah C. Melville and Alice L. Slotsky, eds. *Culture and History of the Ancient Near East*. VOLUME 42, Brill, (Leiden, Boston, 2010), pp. 291-300.

<sup>3</sup> For a comprehensive list of cuneiform texts with music theory, see Dumbrill, R., *The Archaeomusicology of the Ancient Near East*, TRAFFORD, (Victoria, 2005), pp. 12-114.

| 4 | Line | Sumerian           | Akkadian           | Translation                     |
|---|------|--------------------|--------------------|---------------------------------|
|   | 1    | sa.di              | qud-mu-u[m]        | front string                    |
|   | 2    | sa.u. <sup>4</sup> | ša-mu-šu-um        | next string                     |
|   | 3    | sa.3.sa.sig        | ša-al-šu qa-a[t-nu | third, thin string              |
|   | 4    | sa.4.tur           | a-ba-nu-[ú         | fourth, small/Ea-created-string |
|   | 5    | sa.di.*5           | ha-am-[šu          | fifth string                    |
|   | 6    | sa.4.a.ga.gul      | ri-bi úh-ri-im     | fourth behind string            |
|   | 7    | sa.3.a.ga.gul      | šal-ši úh-ri-im    | third behind string             |
|   | 8    | sa.2.a.ga.gul      | ši-ni úh-ri-im     | second behind string            |
|   | 9    | [sa.1].a.ga.gul    | úh-ru-um           | behind string                   |
|   | 10   | [9].sa.a 9         | pi-it-nu           | nine strings                    |

<sup>5</sup> Said of a musical scale which is contained and constructed within the boundaries of one octave.

<sup>6</sup> Generally relating to, or based upon a scale of five tones and two semitones forming the basis of the Western musical system. However, diatonism can also be the consequence of constructions resulting in pitches with other quantifications than those forming the basis of Western musical systems although most theoreticians reject systematically this postulation on the premise of the universality of Western diatonism that they are unable to define accurately either in quantification or in construction. The word stems from Late Latin *diatonicus*, from Greek διατονικός, from διάτρεχος extending. It must be stressed that the first usage of the term 'diatonic' is recorded no earlier than in 1694.

<sup>7</sup> Of a scale made up of seven pitches the sequence of which resulting from a specific construction the basis of which unattested in antiquity or later, satisfactorily.

<sup>8</sup> There is an on-going dispute between two schools of thought, the first conditioned by dogmatic *a prioricity* (see Field, H., Epistemological nonfactualism and the 'a prioricity' of logic. *Philosophical Studies: An International Journal for Philosophy in the Analytic Tradition*. Vol. 1/2, 'A Priori Knowledge' (Oct., 1998, pp. 1-24).) which sustains the irrational belief in the universality of Western diatonism(s). This position finds reasonable, firstly to infer anything without any empirical evidence,

infallibly, because in this case nothing can be taken as evidence against it, and that as a consequence (undefined) diatonism must be the consequence of ‘just intervals theory’, or of the ‘theory of resonance’, or for the reason that ‘it cannot be otherwise than it is; for as all things have been created for some end, they must necessarily be created for the best end.’<sup>2</sup> Candide, Voltaire.

<sup>9</sup> Dumbrill, R., ‘Evidence and Inference in Texts of Theory in the Ancient Near East’ in *ICONEA 2008*, Irving Finkel and Richard Dumbrill, eds. ICONEA PUBLICATION, LONDON. (London, 2010), pp. 105-16. Dumbrill, R., Four Tables from the Temple Library of Nippur: A Source for Plato’s Number in relation to the quantification of Babylonian Tone Numbers. In *ARANE*, Vol. 1, (London, 2009), pp. 27-37. <http://www.iconea.org/pdf/arane12009.pdf>. Dumbrill, R., ‘Music Theorism in the Ancient World’ in *ICONEA 2009-2010*, GORGLAS, (Piscataway, 2010), pp. 107-32. Dumbrill, R., *The Archaeomusicology of the Ancient Near East*, TRAFFORD, (Victoria, 2005), pp. 12-114.

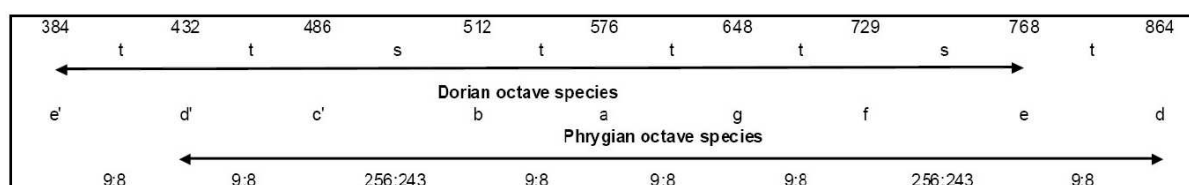
<sup>10</sup> I write ‘mythical Pythagoreanism’ for the reason that a) there is no evidence that Pythagoras ever existed, b) and that in case he existed, there is no evidence that he wrote anything about music theory in his life time. Furthermore, some are of the opinion that the name of Pythagoras is derived from Greek Πυθιος (*Pythios*), a name of Apollo, and αγορά (*agora*) ‘market’. This conjectural etymology would further agree with the mythological nature of Pythagoreanism as a whole. However, McClain questions the etymology of Pythagoras in Greek, suspecting from internal evidence ‘[...] that the name is intended as a humorous pun that natives found irresistible for a wholly fictitious character. John Bremer alerted me to this problem perhaps two decades ago by pointing out that my simplistic assumption that is name derives from the python in the agora as place of assembly[] (or market) is not correct. Here is the Wikipedia entry agrees on this point: ‘He spoke (agor-) the truth no less than did the Pythian (Pyth-),’ and Iamblichus tells the story that the Pythia prophesied that his pregnant mother would give birth to a man supremely beautiful, wise, and beneficial to humankind. A late source gives his mother’s name as Pythais. As to the date of his birth, Aristoxenus stated that Pythagoras left Samos in the reign of Polycrates, at the age of 40, which would give a date of birth around 570 B.C. All testimonies about him, however, are from later centuries. On the basis of all stories told about him I insist that this is a very great historical fiction cultivated by earlier Greeks and miss-read by later authors who accepted his fame, lacking a iota of evidence. I invite anybody to cite a plausible story, particularly since the decoding of cuneiform mathematics in the last century that gives plausible evidence for [Ancient Near Eastern] mastery for a thousand and more years earlier. There is no longer anything left for him to have discovered. In brief, the whole of ancient science has been miss-represented in Academia by this early sense of humor, quite characteristic of all early animal mythology, and encouraged by Plato’s relentless punning. This genial corruption of the history of mathematics now becomes a critical problem for history of religion as we discover the numerical and geometrical content of tales in our sacred texts. In short, we inhabit a fool’s paradise of total nonsense about the wisdom of the ancients during the thousands of years they defined knowledge as knowing the right number. This jest is no longer amusing if we care earnestly about truth. This has become the story of my own professional life. I consider it of fundamental importance to [the late] Duane [Christensen’s] reading of the Canon and to the education of new Christian ministers. Truth can be stranger than fiction. How did a gourd ever become a kind of flute? Why is Apollo as far shooter among the Greek gods also known as the mouse god (*Smintheus*). Our fathers, the Old Ones, laughed early and often. Think of the merriment in heaven as they look down at us now. It might be a place really worth visiting for a thousand years between rebirths. Truly congenial, as life not always seems.’

<sup>11</sup> All the Greek material of music theory comes from very late copies and translations/adaptations of the Western 10<sup>th</sup>-11<sup>th</sup> centuries.

<sup>12</sup> For instance, the construction of a heptatonal paradigm ascribed to Euclid and to others, has never been produced in any original document or in any of their post-crusade Mediaeval translations/interpretations.

<sup>13</sup> e.g. Cornford, F.M., *Plato’s Cosmology: The Timaeus of Plato*, Hackett, (London 1997), omits the description’ of Socrates’ ‘sovereign number’. Waterfield, R., *Plato: Republic* (translation, introduction, notes), Oxford University Press, 1993 (World’s Classics, 1994; Book of the Month Club, February 1994), notes ‘scholars nowadays largely ignore the passage’. (See Crickmore, Leon, ‘Hesiod’s ‘races’ and ‘political degeneration’ in Plato, in *ARANE*, Vol. 1, (London, 2009), pp. 56-7. <http://www.iconea.org/pdf/arane12009.pdf> .

14



The Dorian and Phrygian octave species in Pythagorean tuning, with tone-numbers corresponding to the first nine terms of Plato’s ‘World Soul’ (*Timaeus*, 34-7). The original terms, 1, 2, 3, 4, 8, 9, 27 have to be multiplied by 6 and then by 64 to ensure integers.

| 2400 |         | 2700    |           | 3000        |       | 3200       |        | 3600     |     | 4050 |       | 4320 |      | 4800 |     | 5400 |
|------|---------|---------|-----------|-------------|-------|------------|--------|----------|-----|------|-------|------|------|------|-----|------|
|      | t       |         | t         |             | s     |            | t      |          | t   |      | s     |      | t    |      | t   |      |
|      | 9:8     |         | 10:9      |             | 16:15 |            | 9:8    |          | 9:8 |      | 16:15 |      | 10:9 |      | 9:8 |      |
| a'   |         | g'      |           | f'          |       | e'         |        | d'       |     | c'   |       | b    |      | a    |     | g    |
|      |         |         |           |             |       |            |        |          |     |      |       |      |      |      |     |      |
| Clio | Euterpe | Thaleia | Melpomene | Terpsichore | Erato | Polyhymnia | Urania | Calliope |     |      |       |      |      |      |     |      |

The Muses as factors of 604 (36002)

<sup>15</sup> Gurney, Oliver, O.R., 'An Old Babylonian Treatise on the Tuning of the Harp'. *IRAQ* XXX (1968).

<sup>16</sup> Gurney, O.R., 'Babylonian Music Again'. *IRAQ* LVI, (1994).

<sup>17</sup> This proves that the concept of consonance versus dissonance existed at least 4000 years ago.

<sup>18</sup> It is not the purpose of this paper to discuss the instructions in text B. However, simply described, the text is composed of (9) quatrains. Each goes this way:

If the instrument is tuned in the scale of 1  
The tritone is placed between strings a and b  
Tune up (or down) (by a semitone) string, a (or b or a and a')  
As a result the instrument will be tuned in the scale of 2

When the instrument is tuned in the scale of 2  
The tritone is placed between strings c and d  
Tune up (or down) (by a semitone) string c (or d or c and d')  
As a result the instrument will be tuned in the scale of 3

When, etc.

<sup>19</sup> This would allow for the generation of what most musicologists would call 'mode'. However, I am against the indiscriminate usage of the term, which anyway is a very recent addition to the musicological lexicon, with no accurate definition outside Western Mediaeval and early Renaissance music. Its usage beyond, and especially in the fields of ethno and archaeomusicology, is highly conjectural for reasons that are too numerous to mention in the present paper. (see ICONEA Seminar of the 27 February 2013, 17:00 – 18:30: Modality in Question; Speaker: Richard Dumbrill; Venue: Room G21a (Ground Floor); Venue: South Block, Senate House, Malet Street, London WC1E 7HU. <http://www.iconea.org/?cat=18>).

<sup>20</sup> Aristoxenus described the various different sizes of intervals in his classification of shades and genera of tetrachord scales. But he never used any mathematics in his theory beyond simple geometric subdivisions of the tone. This was, in fact, the aspect of his music-theory that was distinctively new, a result of the formulation of classic geometry around this time by Euclid. Aristoxenus adamantly maintained that all larger musical intervals could and should be determined solely by ear. Both of these basic tenets were in sharp contrast to Pythagorean theory and other rational harmonic theories. Aristoxenus's theory was forgotten in Western Europe after the Germanic invasions (400s AD), then rediscovered during the Renaissance. The earliest surviving manuscript of his treatise was written in Constantinople [Istanbul] around 1150, so his theory seems to have remained known the whole time in the Greek-speaking areas. When his work was rediscovered by the Italians around 1450, the idea of 12-tone equal-temperament (the ordinary scale in everyday use today) was a topic of much debate, and many theorists who advocated that tuning interpreted Aristoxenus's approximations of small intervals as a justification for it. They were wrong, or at any rate not entirely correct, but the idea has persisted for over 500 years. <http://tonalsoft.com/monzo/aristoxenus/318tet.htm>

<sup>21</sup> Many conceptualize the octave as an interval. My opinion is that it is a unison on the basis that all of its harmonics are the identical, whether unison or octave(s). It is my contention that the octave is the repetition or the doubling of the unison. Since the unison is not an interval, the octave is not either.

<sup>22</sup> Kilmer, A., 'A music tablet from Sippar?': BM 65216 + 66616' *IRAQ* XLVI, Part 2, Autumn 1984, pp. 69-79.